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A NEW BRITISH APHID FROM *PRUNUS PADUS* L., *MYZUS PADELLUS* SP. N. (HEMIPTERA, APHIDIDAE)

By Dr. Hille Ris Lambers [1] and J. P. Rogerson. [2]

Apterous viviparous female.

Morphology (from specimen cleared by Roepke's method). Body rather broadly oval, about 2·00–2·30 mm. long, with membranous, colourless, very faintly wrinkled tergum, on which only the following parts are sclerotic and faintly pigmented: irregular small sclerites at the bases of the spinal hairs of mesonotum, metanotum, Ist and VIIth abdominal tergite, and a transverse bar across VIIIth tergite. Dorsal hairs long and fine, acute; those on IIIrd abdominal tergite about as long as basal diameter of IIIrd antennal segment; VIIIth abdominal tergite with 4 hairs. Spinal or marginal tubercles absent. Head remarkably dark sclerotic, covered with numerous nodules, which on the convex middle part of the front are sub-acute, otherwise blunt. Frontal tubercles low, well developed, as typical for the genus, but inner margins nowhere converging. Cephalic hairs like those on dorsum. Antennae slightly more than half the length of the body, covered with blunt scales which towards their apices change into the normal imbrications; segments I, II, V and VI as dark as the head, III and base of IV pale, the latter with darker apex; processus terminalis about 3 times as long as base of segment VI, shorter than segment III; secondary rhinaria absent. Hairs on segment I like those on the front, but those on segment III shorter, with spear-shaped apices, about half as long as the basal diameter of segment III. Rostrum short, only reaching to middle coxae; apical segment rather short and blunt, about as long as second joint of hind tarsi, with 2–4 hairs besides the 3 apical hairs. Siphunculi opaque jet black, or sometimes with brown, transparent base, slightly tapering from base to apex, where they are a little constricted, about $\frac{1}{8}$ length of the body, densely and markedly imbricated, with a small flange. Cauda triangulate, about equilateral, with straight sides, rather acute, black, but less pigmented than the siphunculi, about $\frac{3}{8}$–$\frac{4}{9}$ length of the siphunculi, with 4–6 hairs. Subgenital plate blackish, paler cephalad. Legs rather short, anterior femora brownish-yellow, middle femora mottled blackish-brown with paler base, hind femora unevenly blackish with paler base, all the tibiae brownish dorsally, blackish towards apices; first tarsal joints with 3, 3, 3 or 3, 3, 2 hairs.

Colour of living specimen: bright saffron-yellow; siphunculi black; head, antennal segments I, II, apices of IV and whole of V and VI blackish-brown; whole of III and base of IV yellowish. Legs with femora, apices of tibiae and all tarsi blackish-brown, rest paler. Cauda dusky.

Measurements in mm.

No.	Body length	Antennae	Siphunculi	Cauda	Antennal segments			
					III	IV	V	VI
1	2·14	1·35	0·36	0·16	0·36	0·25	0·18	0·11+0·29
2	2·24	1·24	0·34	0·13	0·31	0·21	0·17	0·10+0·29
3	2·15	1·26	0·37	0·14	0·34	0·23	0·17	0·11+0·26
4	2·00	1·28	0·38	0·14	0·35	0·23	0·17	0·09+0·29
5	2·08	1·15	0·38	0·14	0·32	0·20	0·15	0·09+0·24
6	2·15	1·31	0·37	0·14	0·37	0·24	0·17	0·09+0·30

[1] Bennekom, Netherlands.
[2] Dept. of Agriculture, King's College, Newcastle-upon-Tyne.

Nymph, 3rd instar.

Morphology: Hind tibiae dorso-apically with many blunt spinules between the hairs.

Colour of living specimen: bright saffron yellow; siphunculi black; apices of antennae, femora, tibiae and all tarsi dusky brown; wing pads and thoracic lobes dusky-brown; eyes and lateral stemmata red; tip of rostrum dusky.

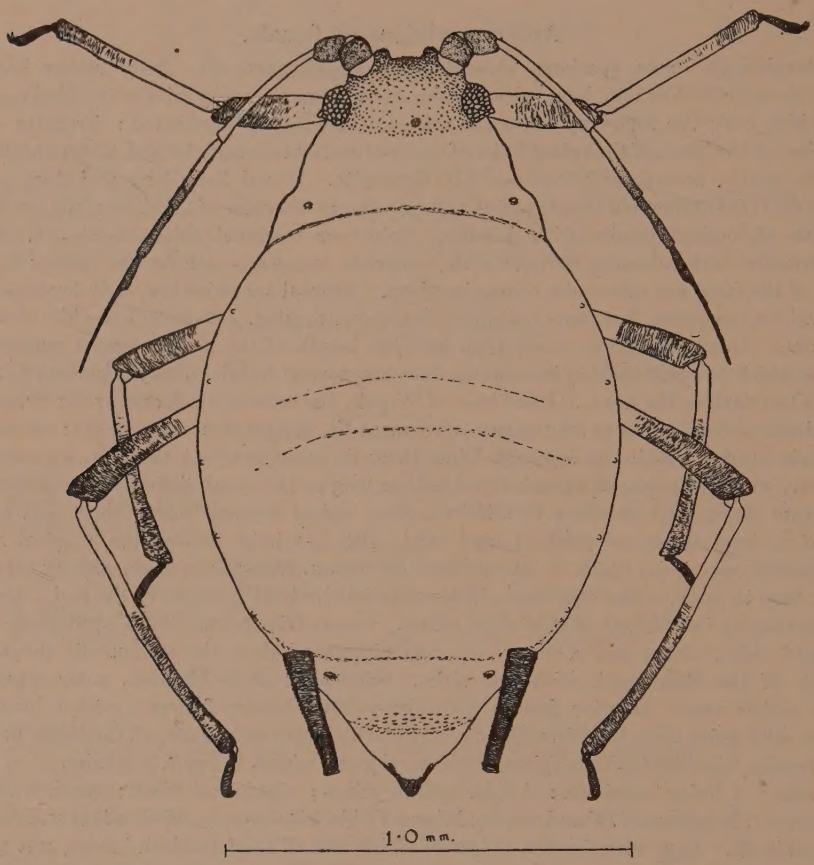

FIG. 1.—*Myzus* (*Prunomyzus*) *padellus* sp. n. apt. viv. ♀ (hairs omitted).

Alate viviparous female.

Morphology: Head and thorax blackish sclerotic; abdomen with a rather small, not strongly pigmented central sclerite, which extends from the spinal hairs of the IIIrd tergite or the anterior margin of the IVth tergite to almost the spinal hairs of the VIth tergite; this sclerite is very irregular, much perforated, posteriorly emarginated and laterally connected with the rather large pleural intersegmental sclerites; marginal sclerites rather large, imbricated as usual. Dorsal hairs much shorter than those in apterae, with blunt or spear-shaped apices. Head smooth; frontal tubercles low, rounded, projecting only little beyond the apex of the median ocellus. Antennae as dark as the head, with extreme base of segment III paler, about $\frac{1}{5}$ body length, rather smooth, with base of segment III finely imbricated; segment III with about 17–33 (aver. 27·3) rather large hardly tubercular

rhinaria over its whole length and about ¾ of its circumference; segment IV with about 6–14 (aver. 8·9) rhinaria along one side; segment V with 0–4 (aver. 1·48) rhinaria in a line. Antennal hairs very short, inconspicuous. Siphunculi a little thinner than in apterae, black, imbricated, or rather, with rows of faint spinules, which dorso-apically may be inter-connected to form cell-like pseudo-reticulations (vide figure). Cauda ½ length of siphunculi, paler, more acute than in apterae, acuminate. Wing venation normal, the veins dark brown and narrowly but distinctly bordered with brown. Remainder about as in apterae.

Colour of living specimen: general body colour bright saffron-yellow; head, thorax and siphunculi black; antennae blackish except extreme base of III which is paler; dorso-median abdominal sclerite blackish-brown. Legs yellow, apices of femora, tibiae and whole of tarsi dark brown. Eyes dark red. Cauda dusky.

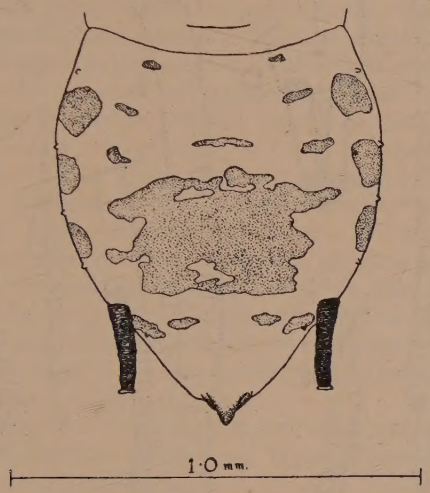

FIG. 2.—*Myzus* (*Prunomyzus*) *padellus* sp. n. abdomen of alate viv. ♀ showing sclerotic pattern (hairs omitted).

Measurements in mm.

No.	Body length	Antennae	Siphunculi	Cauda	Rhinaria on antennal segments			Antennal segments			
					III	IV	V	III	IV	V	VI
1	1·97	1·62	0·28	0·14	30 & 30	9 & 10	3 & 2	0·45	0·32	0·22	0·12+0·36
2	1·84	1·54	0·28	0·14	30 & 32	12 & 10	4 & 2	0·44	0·29	0·21	0·11+0·34
3	2·11	1·65	0·29	0·13	25 & 32	8 & 9	3 & 4	0·50	0·31	0·22	0·12+0·35
4	2·05	1·69	0·27	0·14	29 & 33	12 & 10	3 & 3	0·49	0·34	0·24	0·13+0·34
5	1·94	1·61	0·26	0·13	25 & 26	9 & 10	1 & 2	0·44	0·32	0·21	0·13+0·36
6	1·95	1·69	0·28	0·14	25 & 28	9 & 11	0 & 3	0·48	0·32	0·24	0·13+0·37

Discussion.

This aphid is known only from *Prunus padus* L., on which plant it was discovered at Houxty on Tyne, Northumberland, on 26.vi.1943 by the second author. More were collected on 20.vi.1945 at the same locality, while one

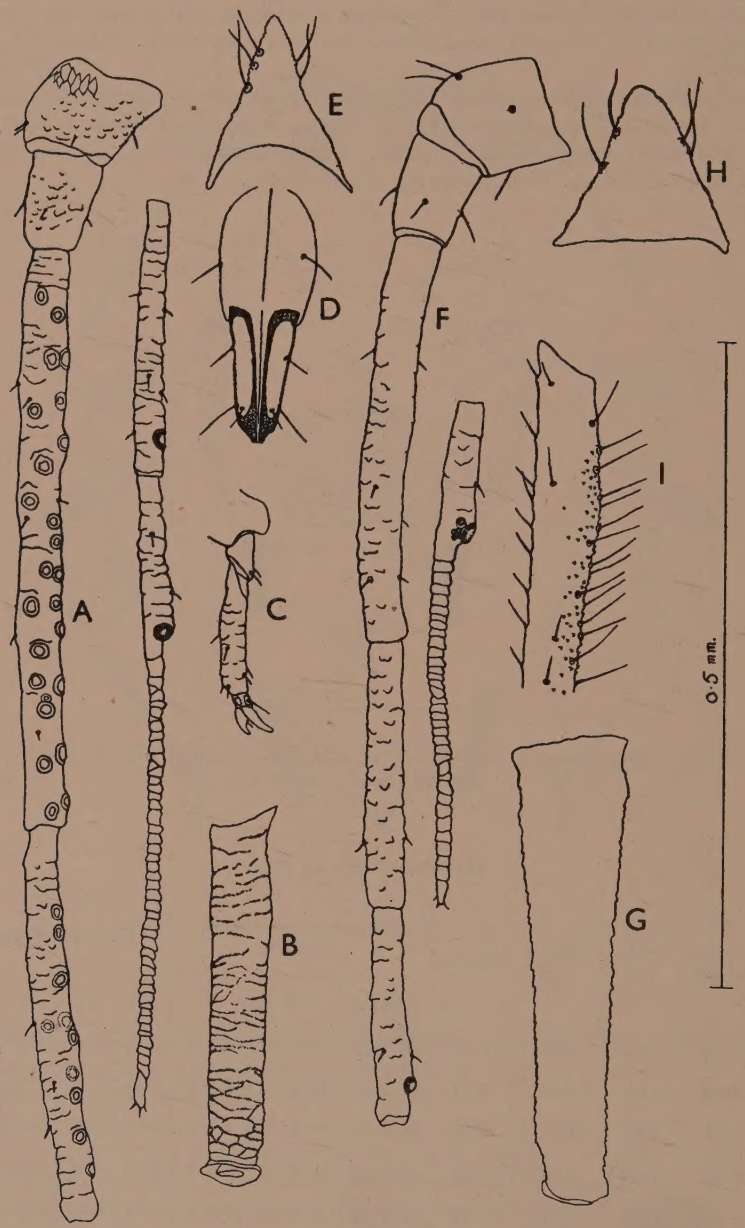

Fig. 3.—*Myzus* (*Prunomyzus*) *padellus* sp. n. A, antenna; B, siphunculus; C, hind tarsus; D, ultimate segment of rostrum; E, cauda of alate viv. ♀; F, antenna; G, siphunculus; H, cauda of apt. viv. ♀; I, hind tibia of 3rd instar nymph.

fundatrix with atrophied antennae and legs was reared from eggs taken there. It lives in red and yellow leaf-galls which are similar in appearance to those caused by *Rhopalosiphum padi* L., but are rather more blistered than rolled. As the major part of the samples taken consists mainly of alatae and late-instar nymphs, and a careful search of the food-plant after the end of June failed to produce any further specimens, we suppose that, like the other *Prunus*-infesting *Myzus* spp., this species migrates to summer host-plants at present unknown. We know of no described aphid which might be part of the cycle of the species under description.

The systematic position of this species is quite clear. The structure of the frontal tubercles, siphunculi and cauda, and also the development and shape of the central abdominal sclerite in the alatae indicate close relationship to *Myzus* Passerini in its strictest sense. One more character is very typical for this genus and a small group of derived genera—viz., the presence of numerous little warts on the apical part of the hind tibiae in larval forms. Two characters of this species do not agree with the other three or four species of *Myzus* Passerini *sensu stricto*—viz., the presence of numerous rhinaria on the IVth and Vth antennal segments in the alatae and the distinctly membranous tergum of the apterae viviparae. Only exceptionally do a few rhinaria occur on the IVth antennal segment in typical *Myzus* Passerini, and although the tergum in other spp. may be little pigmented, it is sclerotic, usually very distinctly so (*M. cerasi* Fabricius, *M. lythri* Schrank, *M. ornatus* Laing). The distribution of the rhinaria sometimes shows strong variation within a genus, e.g. in *Cavariella* Del Guercio, where *aegopodii* Scopoli, *pastinacae* L., and *theobaldi* Gill. & Bragg have rhinaria only on segment III, but *archangelicae* Scopoli also always has them on segment IV and *cicutae* Koch and several Japanese spp. have them also on segment V. According to the first author's experience, however, the various types of sclerotisation show little variation.

Therefore, we think the erection of a new subgenus to *Myzus* is warranted. This subgenus, **Prunomyzus** subgen. n., type *Myzus* (*Prunomyzus*) **padellus** sp. n., may be described as follows :—

Resembling *Myzus* Passerini *sensu stricto*, but tergum in apterae viviparae not sclerotic but membranous; alatae with rhinaria on antennal segments III, IV and V, besides having a distinct central sclerite on abdomen.

Types : Cotypes in the British Museum (Natural History), London, and in the collections of both authors.

NOTES ON THE NOMENCLATURE OF THE BEES (HYMENOPTERA, APOIDEA)

By Vladimir B. Popov.

1. *Andrena baicalica* Kokujev, 1927.

The type of *Andrena baicalica* Kokujev (1927, *Trav. Comm. Lac. Bajkal* **2** : 85, ♀) is now in the collection of the Zoological Institute, Academy of Sciences, Leningrad. It is in bad condition and agrees with the usual interpretation of *A. simillima* F. Smith (1851, *List Brit. Anim. Brit. Mus.* **6** : 122, ♀♂), being quite similar to Russian and Siberian specimens of the latter species determined by F. Morawitz. However, all of them differ slightly from the female *A. simillima* F. Smith from England, determined and sent to me by Dr. P. Bluthgen.

2. *Dufourea flavicornis* Friese, 1914.

The type of *Dufourea flavicornis* Friese (1914, *Annu. Mus. zool. Acad. St. Pétersb.* **18** : lx, ♂) is in the same collection in Leningrad. It belongs to the genus *Rophites* Spinda and is allied to *R. quinquespinosus* Spinda and *R. caucasicus* F. Morawitz.

3. *Panurgus clypeatus* Eversmann, 1852.

The type of *Panurgus clypeatus* Eversmann (1852, *Bull. Soc. Nat. Moscou* **25** : 62, ♂) from Irkutsk is in the collection of the Zoological Institute, Leningrad. It is a stylopized female of *Panurginus labialis* (Eversmann) (1852, *loc. cit.* **25** : 62). Two females of Strepsiptera are to be found between tergites 4 and 5. Antennal joints from 7 to 12 pale brownish beneath; clypeus and small spots at base of the first joint in the middle and hind legs, yellow.

Panurgus clypeatus Eversmann was correctly transferred by Friese to the genus *Panurginus* Nylander, at first doubtfully in 1897, *Természetr. Füz.* **20** : 96 and finally in 1897, *Mitt. Schweiz. ent. Ges.* **10** : 19.

The female type of *Panurginus labialis* (Eversmann) from Spassk is also stylopized by two specimens of Strepsiptera.

4. *Melitturga spinigera* Friese, 1902.

The description of *Melitturga spinigera* Friese (1902, *Z. Hym. Dipt.* **2** : 107, ♂) corresponds exactly with the type of *M. spinosa* F. Morawitz (1892, *Horae Soc. ent. ross.* **26** : 137, ♂). The type of Morawitz's species is in the collection of the Zoological Institute, Leningrad. Friese believes his species to be allied to *M. spinosa* F. Morawitz, but F. Morawitz's description is incorrect, his male of *M. spinosa* having no tubercles or spines on the base of the labrum; the labrum has only a bilobed tubercle at the apex that corresponds exactly with Friese's description.

5. *Anthophora pygmaea* Gussakovskij, 1935.

Anthophora (*Amegilla*) *pygmaea* Gussakovskij (1935, *Trav. Inst. zool. URSS* **2** : 738, ♂) is preoccupied by *A. pygmaea* Dours (1869, *Monogr. icon. Anthophora* 151, ♂), which is a quite different species. I propose *Anthophora* (*Amegilla*) **gussakovskyi** nom. nov.

6. *Ammobates asiaticus* F. Morawitz, 1895.

Owing to the kindness of Mr. V. Gussakovskij I have been able to examine a couple of *Ammobates* from Aman-Kutan, Uzbekistan, 5.vii.1932. The female agrees with the type of *A. asiaticus* F. Morawitz (1895, *Horae Soc. ent. ross.* **29** : 45, ♀) and the male agrees with the type of *A. nigrinus* F. Morawitz (*in* : Fedtschenko, 1875, *Puteshestvie v Turkestan* (Travel in Turkestan), *Zoogeographicheskia Izsledovania*, **8**, Hymenoptera Mellifera, **1** : 145, ♂); both types mentioned above are in the collection of the Zoological Institute, Leningrad. The name *nigrinus* must stand.

7. *Heriades trinacria* F. Morawitz, 1870.

The type of *Heriades trinacria* F. Morawitz (1870, *Horae Soc. ent. ross.* **6** : 41, ♂ = *Eriades trinacrius* Friese, 1898, *Bienen Europa's* **4** : 34; 1911, *Tierreich* **28** : 14) from Luga, now Leningrad gov. (coll. S. Solsky) is in the collection of the Zoological Institute of Leningrad. It agrees with the usual modern interpretation of *Osmia* (*Osmia*) *robusta* (Nylander) (1848, *Notiser Sällsk. Fauna Fenn. Förhandl.* **1** : 270, ♂). The type of *H. trinacria* F. Morawitz is small and in bad condition.

8. *Chelostoma signatum* Eversmann, 1852.

The type of *Chelostoma signatum* Eversmann (1852, *Bull. Soc. Nat. Moscou* **25** : 73, ♂; = *Eriades signatus* Friese, 1898, *Bienen Europa's* **4** : 46; 1911, *Tierreich* **28** : 17) from Irkutsk is in the collection of the Zoological Institute, Leningrad. It agrees with the usual interpretation of *Osmia tuberculata* Nylander (1848, *Notiser Sällsk. Fauna Fenn. Förhandl.* **1** : 263, ♂).

In both cited papers Friese incorrectly noted the range of *Chelostoma signatum* Eversmann as " Ural-Gebiet "; Eversmann noted the species from " terris transuralensibus," as he usually indicated specimens from Irkutsk.

9. *Megachile baicalica* Kokujev, 1927.

The type of *Megachile baicalica* Kokujev (1927, *Trav. Comm. Lac. Bajkal* **2** : 15, ♀; Cockerell, 1930, *Entomologist* **63** : 184, ♀) is now in the same collection, Leningrad. It agrees with the usual interpretation of *M. fulvimana* Eversmann (1852, *Bull. Soc. Nat. Moscou* **25** : 71, ♂; Radoszkovsky, 1874, *ibid.* **47** : 131, ♂; Friese, 1899, *Bienen Europa's* **5** : 116, ♂; 1911, *Tierreich* **28** : 192, ♂). I have seen a female specimen from Krasnoyarsk, Siberia, in the collection of the Zoological Institute, Leningrad, labelled by F. Morawitz " *M. ulvimana* Eversmann ♀ " which agrees exactly with Kokujev's type of *M. baicalica*; there are also some males of *M. fulvimana* Eversmann from Krasnoyarsk identified by F. Morawitz too.

M. circumcincta Kirby var. *lactescens* Cockerell (1928, *Ann. Mag. nat. Hist.* (10) **1** : 355, ♀) is probably a synonym of *M. fulvimana* Eversmann; see also Cockerell (1930, *Entomologist* **63** : 184).

10. *Megachile saussurei* Radoszkowski, 1874.

Megachile saussurei Radoszkowski, 1874, *Bull. Soc. Nat. Moscou* **47** : 142, ♀, pl. 1, f. 33; Friese, 1899, *Bienen Europa's* **5** : 160, ♀; 1911, *Tierreich* **28** : 206, ♀ (*Pseudomegachile*); F. Morawitz *in* : Fedtschenko, 1875, *Puteshestvie v Turkestan, Zoogeograph. Izsledovania*, **8**, Hymenoptera Mellifera, **1** : 108, ♀ (*nec* ♂); Popov, 1935, *Trav. filiale Acad. Sci. l'URSS au Tadjikistan* **5** : 387, ♀; *M. multispinosa* F. Morawitz *in* Fedtschenko, 1875, *Puteshestvie etc.* : 118,

♂; Friese, 1899 *Bienen Europa's* **5** : 141, ♂; 1911, *Tierreich* **28** : 201, ♂ (*Pseudomegachile*); Cockerell, 1930, *Ann. Mag. nat. Hist.* (10) **5** : 409, ♂; Popov, 1935, *Trav. filiale Acad. Sci. l'URSS au Tadjikistan* **5** : 385, ♂.

The male of *M. saussurei* Radoszkowski was described by F. Morawitz (*in* Fedtschenko, 1875, *Puteshestvie, etc.* : 109); the type of the male is in the collection of the Zoological Institute, Leningrad. It agrees with usual interpretation of *M. argentata* Fabricius (1793, *Ent. Syst.* **2** : 336).

I believe *M. multispinosa* F. Morawitz to be the male of *M. saussurei* Radoszkowski, which is the older name.

The two forms are closely allied morphologically and fly together in the same flower associations and localities of Turkestan, collecting pollen and nectar on alfalfa (*Medicago sativa*). In 1937 I collected on alfalfa 76 ♀ (12.vi.–7.viii.) and 119 ♂ (19.vi.–19.vii.) at Djuma near Samarkand, Uzbekistan, and in 1938 5 ♀ (11.vi.–6.viii.) and 2 ♂ (6–15.vi.) at Kurgan-Tube near Andizhan, Uzbekistan. Thus the species is proterandric, as are the great majority of palearctic species of *Megachile* Latreille, and common in Turkestan.

According to Cockerell (1930, *Ann. Mag. nat. Hist.* (10) **5** : 409) *M. semireticulatus* Cameron ♂ from Ferozepur is probably identical with *M. multispinosa* F. Morawitz.

11. *Coelioxys mongolica* Alfken, 1936.

Coelioxys mongolica Alfken (1936, *Ark. Zool.*, **27**, (A) 37 : 22, ♀♂) is preoccupied by *C. mongolica* Friese (1925, *Konowia* **4** : 33, ♀). I propose *Coelioxys* **alfkeni** nom. nov.

12. *Coelioxys brevicaudata* Friese, 1935.

Coelioxys brevicaudata Friese (1935, *Notes ent. Chinoise Musée Heude* **2** : 155, ♀♂) from Kiang-su and Chekiang is preoccupied by *C. brevicaudata* Friese (1905, *Z. Hym. Dipt.* **5** : 141, ♀) from Chile. I propose *Coelioxys* **frieseana** nom. nov.

13. *Coelioxys squamosa* Friese, 1935.

Coelioxys squamosa Friese (1935, *Notes ent. Chinoise Musée Heude* **2** : 157, ♂) from Anhwei is preoccupied by *C. squamosa* Friese (1922, *Zool. Jb.* (*Syst.*) **46** : 42, ♂) from South Africa. I propose *Coelioxys* **squamosula** nom. nov.

14. *Coelioxys parvula* Radoszkowski, 1893.

Coelioxys parvula Radoszkowski (1893, *Horae Soc. ent. ross.* **27** : 51, ♀♂) is preoccupied by *C. parvula* Schenck (1855, *Jb. nassau. Ver. Naturk.* **10** : 147; 1859, **14** : 358, ♂)=*C. rufescens* Lepeletier (1825, *Encycl. Méthod. Insect.* **10** : 109). I propose *Coelioxys* **radoszkowskyi** nom. nov.

15. *Coelioxys paraguayensis* Friese, 1922.

Coelioxys paraguayensis Friese (1922, *Zool. Jb.* (*Syst.*) **44** : 471, pl. 25, f. 52, ♀♂) is preoccupied by *C. paraguayensis* Schrottky (1909, *An. Soc. cien. Argent.* **68** : 262, ♀). Prof. H. Friese, who was informed by me in 1932, proposed (*in litt.*) the name *Coelioxys* **villarichäensis** Friese nom. nov. As far as I know, this new name, as well as two following ones, were never published.

16. *Coelioxys piliventris* Friese, 1922.

Coelioxys piliventris Friese (1922, *Zool. Jb.* (*Syst.*) **44** : 474, ♂) is preoccupied by *C. piliventris* Vachal (1910, *Ann. Soc. ent. Belg.* **54** : 316, ♂). Prof. Friese proposed *Coelioxys* **hirtiventris** nom. nov.

17. *Coelioxys proxima* Friese, 1925.

Coelioxys proxima Friese (1925, *Konowia* **4** : 21, ♀♂) is preoccupied by *C. proxima* Holmberg (1916, *An. Mus. nac. B. Aires* **28** : 579, ♀). Prof. Friese proposed *Coelioxys* **proximata** nom. nov.

18. *Coelioxys albiventris* F. Morawitz, 1894 and *C. castanea* F. Morawitz, 1886.

Types of *Coelioxys albiventris* F. Morawitz (1894, *Horae Soc. ent. ross.* **29** : 38, ♂), *Coelioxys castanea* F. Morawitz (1886, *Horae Soc. ent. ross.* **20** : 80, ♀) and *Coelioxys sogdiana* F. Morawitz (*in* : Fedtschenko, 1875, *Puteshestvie etc.* : 134, ♀) are in the collection of the Zoological Institute, Leningrad. All the three seem to be one species. *C. sogdiana* F. Morawitz is the earliest name.

The clypeus of the type of *C. castanea* F. Morawitz bears a longitudinal keel, overlooked by F. Morawitz; the structure of the hind spurs is quite similar in the two type females.

The male of *C. acanthura* Klug was first described by Eversmann (1852, *Bull. Soc. Nat. Moscou* **25** : 76) from Indersk, South Ural. This male is in the collection of the Zoological Institute, Leningrad, and agrees with the usual modern interpretation of *C. afra* Lep. J. Pérez (1883, *Act. Soc. linn. Bordeaux* **37** : 285) was the first who described the real male of *C. acanthura* Klug.

There are no males of *C. acanthura* Klug in F. Morawitz's collection determined by him correctly. According to the description of the male of *C. försteri* F. Morawitz (1872, *Horae Soc. ent. ross.* **8** : 213) and the type from Spalato in the collection of the Zoological Institute of Leningrad, I am able to state that all subsequent authors, including H. Friese, interpreted correctly this sex of the species. Unfortunately later on F. Morawitz interpreted it incorrectly. F. Morawitz's male of *C. försteri* F. Morawitz from Koschlagar (1894, *Horae Soc. ent. ross.* **29** : 37) is a male of *C. acanthura* Klug, and a male of *C. acanthura* Klug from Derbent labelled incorrectly as *C. försteri* F. Morawitz (unpublished).

Owing to these mistakes there was a reason to compare the male of *C. albiventris* F. Morawitz with those of *C. försteri* F. Morawitz : in fact this is a correct comparison with *C. acanthura* Klug, a species which is closely allied to *C. sogdiana* F. Morawitz.

The male of *C. sogdiana* F. Morawitz (*C. albiventris* F. Morawitz) was described from Dzhulfa, Transcaucasia, and female (both *C. sogdiana* F. Morawitz and *C. castanea* F. Morawitz) from Turkestan. The sexes are similar morphologically and fly together in the same flower associations and localities of Turkestan. In 1938 I collected 23 ♀ (6.vi.–11.vii.) and 56 ♂ (2.vi.–11.vii.) at Kurgan-Tube near Andizhan, Uzbekistan. Thus the species is proterandric and rather common in Turkestan.

A NEW BRITISH SPECIES OF *MYZAPHIS* VAN DER GOOT ASSOCIATED WITH WILD ROSES, *MYZAPHIS BUCKTONI* SP. N.; AND A COMPARISON WITH *M. ROSARUM* (KALTENBACH) (HEMIPTERA, APHIDIDAE)

By F. H. Jacob.

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In his description of *Hyalopterus dilineatus* Buckton, Buckton (1879) describes a variety of apterous viviparous female which has two broad brown converging lines along the dorsum; Buckton figures this variety, but it is labelled a larva; however, it is undoubtedly the species herewith described. On the same plate, and called *H. dilineatus*, he shows apterous and alate females of *Longicaudus trirhodus* (Walker), a nymph of the same species, and oviparous females of *Myzaphis* sp. Theobald (1927) quotes Buckton's description, and also Mr. F. Laing's opinion that Buckton's slides labelled *H. dilineatus* consist of *Capitophorus rosarum*, *Macrosiphum rosae*, nymphs of *Longicaudus* and one alate female *Longicaudus*. Mr. Laing was doubtful whether the latter is distinct from *L. trirhodus*. Lambers (1934) pointed out that he could see no difference between Theobald's slides labelled *L. dilineatus* (Buckton) and *L. trirhodus*, so considered *L. dilineatus* to be a synonym of *L. trirhodus*. There is no possibility of the species described below being confused with a *Longicaudus* van der Goot, and there can be very little doubt that *Myzaphis bucktoni* is the variety described by Buckton; the marking of the apterous viviparous females is extremely characteristic, the dorsal pattern being reminiscent of *Chaitophorus leucomelas* Koch. D. Hille Ris Lambers indicated to the author that the material described below must be assigned to a new species; it seems appropriate to associate it with Buckton's name.

Van der Goot (1913) erected the genus *Myzaphis* with *Aphis rosarum* Kaltenbach as type, *Aphis abietina* Walker was included, and *Aphis lythri* Schrank was later added by van der Goot (1916). The latter species have subsequently been assigned to other genera. Van der Goot's description of the genus is not clear: this is understandable when it is realised that it includes three such dissimilar species. However, *Myzaphis rosarum* cannot be confused with any other known aphid genus: the sclerotic dorsum with pit-like rugosities, five haired first tarsal joints, head with a large median frontal process and small antennal processes, long slightly swollen siphunculi and long triangular cauda are characteristic features. There is no doubt that *Myzaphis bucktoni* is a closely allied species.

Comparison of *M. bucktoni* with *M. rosarum* (Kaltenbach).

Apart from the conspicuous dorsal pattern of the apterous viviparous females, all stages are readily distinguished by the length of the hairs on the front of the head: they are long in *M. bucktoni*, short in *M. rosarum*; in addition there are generally 4 hairs on the frontal process of *M. bucktoni* and 2 on that of *M. rosarum*. In apterous viviparous females and oviparous females of *M. bucktoni* the frontal process is broad based and convex; in *M. rosarum* it is more or less rectangular: this feature is less pronounced in the fundatrices,

alate viviparous females and males. In all stages the siphunculi of *M. bucktoni* never show more than a very slight tendency to swelling, and are imbricated along their whole length: the fundatrices and apterous viviparous females of *M. rosarum* do not always have swollen siphunculi, but they are present in all the specimens of the other stages which have been examined; and it is only the bases of the siphunculi which are imbricated. The dorsal cuticle of the apterous viviparous females of *M. rosarum* is generally more rugose than that of *M. bucktoni*; in the former the characteristic pit-like rugosities extend on to the head, but this is variable. (This character has been omitted from fig. 1.) In oviparous females of *M. bucktoni* the hind tibiae are somewhat thickened; they are much less so, if at all, in *M. rosarum*. Oviparous females of *M. rosarum* have a pair of large marginal pigmented plates extending from abdominal segment 5 to segment 6; these are absent from *M. bucktoni*. With the exception of the last character, these features are illustrated in figs. 1, 3 and 4.

Myzaphis bucktoni sp. n.

Fundatrix (fig. 1).

Only three specimens were obtained, and of these, two may not be typical: their appearance suggests that they may have been preserved too soon after their final ecdysis.

Living specimen.—Head brown with a paler median line. Eyes very dark red to black. Antennal joints I, II and III dusky translucent; tip of III, IV and V dark brown. Pronotum pale green, dusky, with a continuation of the brown head colouring forming an inverted "U". Abdominal segments 2–8 have brown markings in the pleural region: these markings are variable and may form continuous lines, but are never so conspicuous as in the apt. v. ♀. Siphunculi long and slender, body coloured with a brown tip. Cauda dark brown: it is the darkest part of the body. Legs pale with tips of tibiae and tarsi light brown. Tip of rostrum brown.

Macerated specimen.—Dorsal cuticle sclerotic rugose and pigmented to a varying extent. Pigmentation may be confined to the head, cauda, tip of rostrum, IVth and Vth joints of the antenna, the tips of the tibiae and the tarsi. In one of the specimens there are weakly pigmented patches on the pronotum, and intersegmental patches on the abdomen which converge on the 6th and 7th segments. This is the basic pattern which becomes intensified in the apt. v. ♀. The front of the head is strongly convex, not with such a large frontal process as the apt. v. ♀, but one which extends beyond the very small antennal processes: on the front there are 2–4 long blunt to spathulate hairs, and about 8 similar hairs on the vertex (fig. 1, A). Eyes with well-developed ocular tubercles. Antennae 5 jointed: I is rounded on its inner side and bears a single prominent blunt to spathulate hair which is equal in length to about 2/5 of the basal diameter of the joint; II bears at least one similar hair, which is equal in length to about ½ the basal diameter of the joint; III is about as long as IV + V, and bears several blunt to spathulate hairs which are equal in length to about 5/7 the basal diameter of the joint; IV and V each have a blunt hair near the primary sensorium, which is slightly longer than the basal diameter of its segment: processus terminalis is slightly longer than base of V. Rostrum reaches to 2nd coxae. Siphunculi long, cylindrical, tapering from base to middle, weakly flanged, imbricated. Cauda about 2/3 as long as the siphunculi, strongly tapered to a blunt point, heavily pigmented, with 3 hairs on each side. 8th abdominal segment with 4 moderately long blunt to spathulate hairs, 7th segment with 4. There are several spinal hairs on the mesothorax, but these hairs occur singly from the metathorax to the 7th abdominal tergite; they are generally difficult to see. Pleural and marginal hairs as in the apt. v. ♀. Subgenital plate very

indistinct: it bears 2 anterior hairs and 8–10 arranged in 2 groups on the latero-posterior margin. Coxae, trochanters and femora are not darker than the body, but tips of tibiae, tarsi and claws become progressively darker. As in all the other stages, the first tarsal joints are 5 haired. Hairs on coxae and femora rather sparse, becoming more numerous on the distal halves of the tibiae.

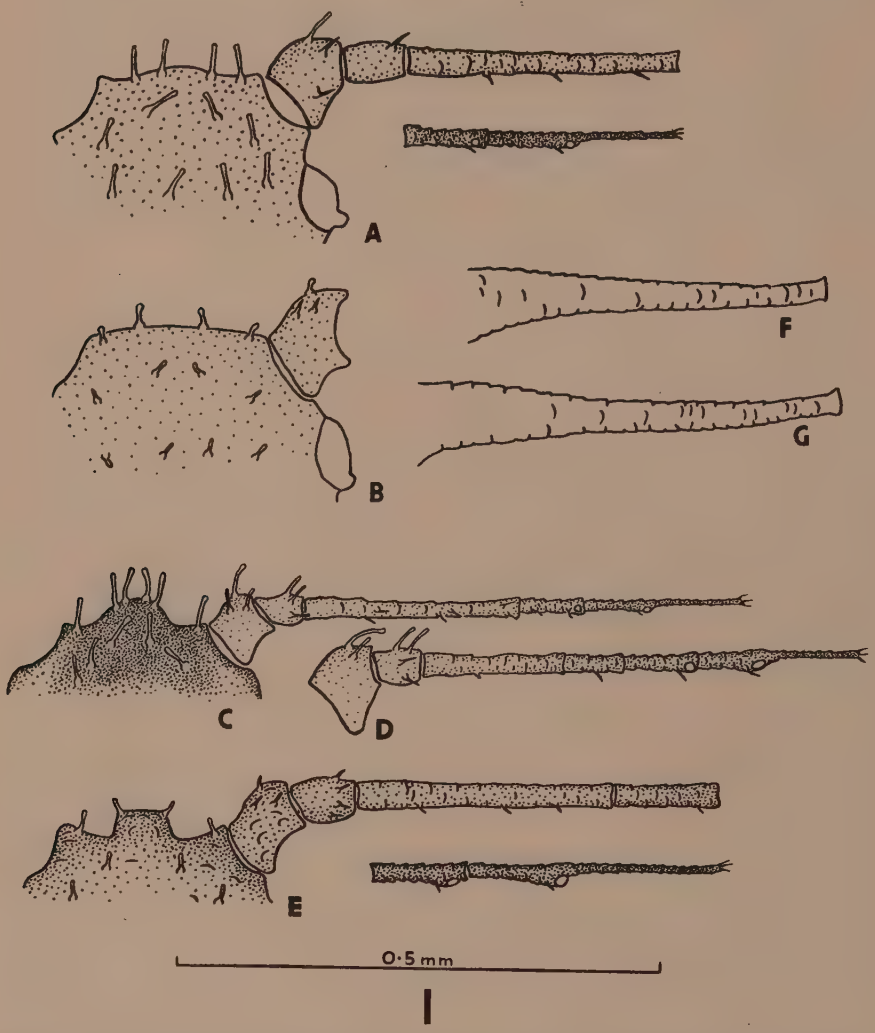

FIG. 1.—*M. bucktoni*. A, head and antenna of fundatrix; F, siphuncula of fundatrix; C and D, head and antennae of apt. vivip. females, 5 and 6 jointed antennae. *M. rosarum*. B, head, G, siphuncula of fundatrix; E, head and antenna of apt. vivip. female.

Measurements of a single specimen.—Body excluding cauda: 2·08 mm.; antenna: 0·683 mm.; proportion of antennal segments: $\frac{17}{III}, \frac{5}{IV}, \frac{5+6}{V}$; siphunculi: 0·366 mm.; cauda: 0·25 mm.; longest hair on front of head: 0·039 mm.

Apterous viviparous female (figs. 1, 2, 4).

Living specimen.—Colour characteristic : ground colour pale yellow to pale green, with light to dark brown dorsal markings in the form of a brown head, 2 large brown patches on pronotum and a pair of broad pleural stripes extending from the mesothorax almost to the base of the cauda : these stripes converge at about the level of the siphunculi. Ventral surface pale yellow to pale green, with base and tip of rostrum and subgenital plate brown. In starved specimens the dorsum appears to be almost completely dark brown.

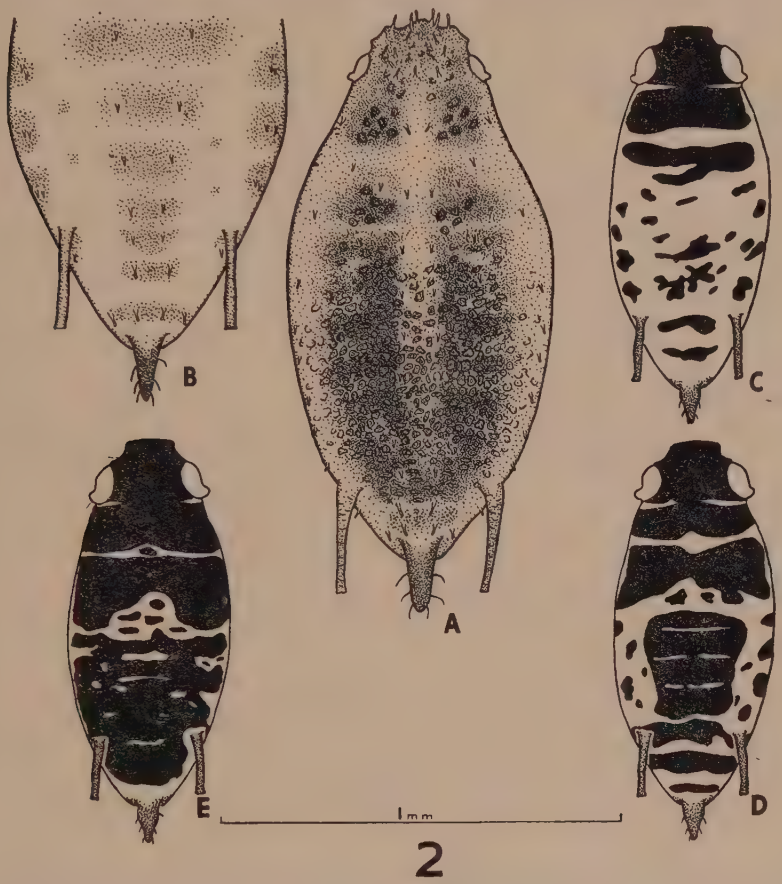

Fig. 2.—*M. bucktoni.* Dorsal patterns of :—A, apt. vivip. female; B, alate vivip. female; C, D and E, apt. males.

Macerated specimen.—Pigmented areas of the dorsum form a very characteristic pattern; the pit-like rugosities of the thoracic and abdominal cuticle being thrown into relief in these areas. The unpigmented area comprises a small area at the base of each antenna, a band between the head and prothorax, a weakening of the pigment between the meso- and metathorax and between the 7th and 8th abdominal segments, a median spindle-shaped longitudinal band ending at about the level of the insertion of the siphunculi, and bounded by an imaginary line running along the line of the spinal hairs, a deep posterior emargination of the prothoracic pigment, and the whole margin of the body. Head narrowest in front, with a large strongly convex median frontal process and very small antennal processes.

The frontal process bears 2 pairs of blunt to spathulate hairs; they are about equal in length to the 2nd antennal segment; there is a similar long hair on each antennal process, and 8 or 9 on the vertex. Eyes with well-developed ocular tubercles. Antennae may be 5 or 6 jointed. When 6 jointed, III is slightly longer than IV + V, and slightly shorter than VI; base of VI about 2/3 as long as processus terminalis. When 5 jointed, III is about $1\frac{1}{4}$ times as long as V, and 5/6 as long as IV + V. I and II and base of III light; antenna becomes progressively darker. The length of the antenna and individual joints is very variable. Antennal hairs are blunt to spathulate, there are 3 or 4 long hairs on I, 3 or 4 on II and III, 1 on IV and V, and 3 or 4 on VI. Rostrum reaches to 2nd coxae. Siphunculi cylindrical, long, slender, imbricated, sometimes a slight tendency towards swelling on

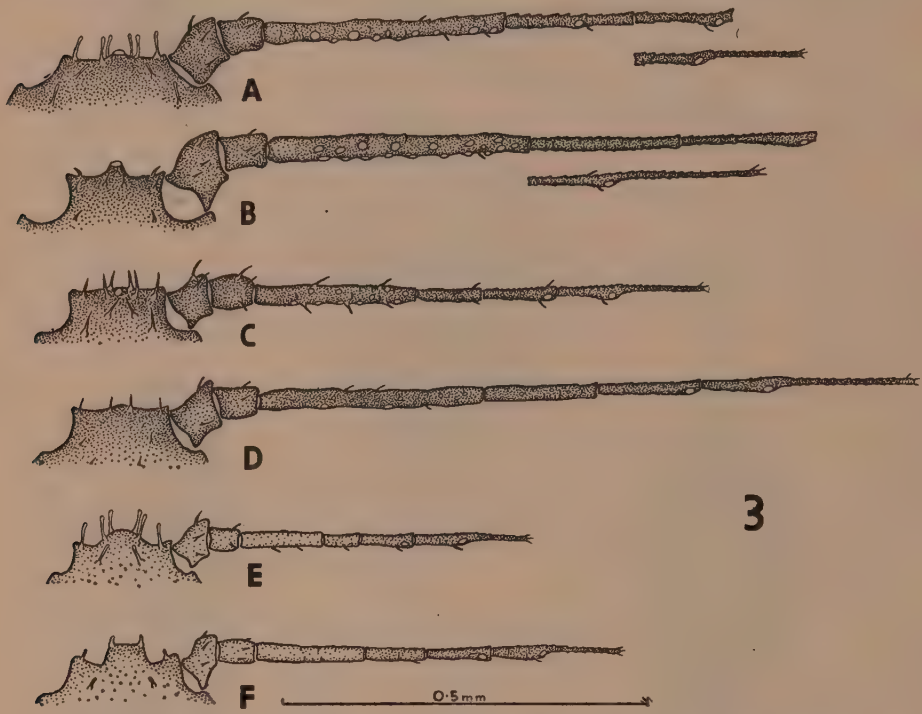

FIG. 3.—A, C, E: *M. bucktoni*, head and antenna of alate vivip. female, apt. male, ovip. female respectively. B, D and F: corresponding features of *M. rosarum*.

distal half, lightly pigmented with paler base. Cauda broad, tapering to a blunt point, 3 long curved hairs on each side, strongly pigmented. Coxae, trochanters and bases of femora very lightly pigmented, tibiae and tarsi about the same as siphunculi, claws strongly pigmented. There are 2 pairs of spinal hairs on the pronotum, but they occur singly from mesothorax to 8th abdominal tergite: pleural hairs occur singly on each thoracic tergite, and very occasionally on other segments. There is a full complement of marginal hairs which generally occur singly. The hairs on segments 7 and 8 are rather longer than the rest of the dorsal hairs. As in all the other stages, the spiracles are kidney-shaped.

Measurements of a single specimen.—Body excluding cauda: 1·33 mm.; antenna: 0·566 mm.; proportion of antennal segments: $\frac{9}{III}, \frac{4}{IV}, \frac{4}{V}, \frac{4+6}{VI}$; siphunculi: 0·25 mm.; cauda: 0·16 mm.; longest hair on front of head: 0·033 mm.

Specimens may be considerably larger.

Alate viviparous female (figs. 2, 3, 4).

Living specimen.—Only known from a pure line culture. Abdomen pale green with a light brown median dorsal patch, and darker green longitudinal pleural stripes. Sclerotised areas of head and thorax are dark brown to black. Dark parts of legs dark brown, light parts light brown. Siphunculi and cauda brown. Antennae dark brown to black.

Macerated specimen.—Does not show the characteristic pattern of the apt. v. ♀: pigmentation of the abdomen is comparatively slight and cuticle is not rugose. Head uniformly dark, sclerotic, with very small antennal processes, front strongly convex. On the front there are 2 pairs of long blunt to spathulate hairs, a similar single hair on each antennal process and about 8 on the vertex. The longest of these hairs are about as long as the second antennal joint. Antennae rather slender; III is longer than IV + V; IV and V about equal; VI is rather less than 2/3 of III; processus terminalis about 3/2 as long as base of VI; III with 10–14 rather large secondary sensoria, IV with 0–1. Antennal hairs tend to be pointed and are less conspicuous than in apt. v. ♀. Very base of III light, rest of antenna strongly pigmented. Thorax more or less uniformly sclerotic. Abdomen with only a light deposit of pigment in the form of three relatively large lateral patches and a smaller one from the anterior margins of which the siphunculi arise, a broad dorsal patch on the second segment and a " V "-shaped patch extending from the 3rd to the 6th segment: this patch may be considerably emarginated or completely divided intersegmentally. Siphunculi long, cylindrical, distal half tends to be enlarged, pigmented. Cauda long, tapering to a blunt point, 3 hairs on each side and in some a single dorsal subapical hair. Cauda and anal plate more strongly pigmented than siphunculi, similar to darkest parts of femora. Legs rather lighter than thorax, trochanters and bases of femora lighter than rest of legs. Subgenital plate large, chitinised to same extent as lateral plates; 2 hairs on anterior part and a row of 10–12 along the hind margin. Pronotum with moderately long spinal and pleural hairs; a few scattered short hairs on meso- and metathorax. Dorsal hairs on abdomen more numerous than in apt. v. ♀: there may be several spinal hairs on segments 1, 2, 3 and 4, but there may be only a single pair as on 5, 6, 7 and 8; pleural hairs sparse and irregular; generally not more than 2 marginal hairs per segment. Wing venation rather prominent, with dusky margins to main veins, a wide margin to subcosta, stigma dusky. Three hooks on hind-wing.

Measurements of a single specimen.—Body excluding cauda: 1·66 mm.; antenna: 1·08 mm.; proportion of antennal segments: $\frac{22}{III}, \frac{10{\cdot}5}{IV}, \frac{10}{V}, \frac{6+8}{VI}$; siphunculi: 0·28 mm.; cauda: 0·18 mm.; longest hair on front of head: 0·032 mm.; secondary sensoria: $\frac{13 \text{ \& } 14}{III}, \frac{0 \text{ \& } 0}{IV}$.

Apterous male (figs. 2, 3, 4).

Living specimen.—Very small, inconspicuous on host plant. Antennae, head, pro- and mesothorax, siphunculi, cauda and genitalia black. Legs dark brown. Abdomen dusky olive green. Rostrum dark brown at base and tip. Eyes very deep red. Frontal process well developed.

Macerated specimen.—Appearance variable, due to wide variation in the pigmentation of the abdomen, and the number of secondary sensoria on the antennae. Head, antennae, rostrum, legs, siphunculi, cauda and genitalia strongly pigmented. Pigmentation of the dorsal cuticle of the abdomen varies from numerous small to medium-sized patches to almost complete pigmentation relieved only by small intersegmental pleural and lateral fenestrae: some specimens have a well-defined median dorsal patch broken intersegmentally, 3 marginal patches and small irregular pleural patches. In mounting, the frontal process tends to be obscured, nevertheless, the head is strongly convex with slight antennal processes. Hairs on head are long and pointed, arranged as in the other stages. Antennal joint III

is longer than IV + V and with 3–14 rather small secondary sensoria; IV shorter than V and with 0–3 small secondary sensoria; V with 0–4 in addition to the primary sensorium; IV is slightly shorter than III and slightly longer than IV + V; VI may have 0–4 secondary sensoria; processus terminalis is considerably longer than base of VI. Siphunculi long, slender, cylindrical, with distal half slightly thicker than basal half, lightly imbricated. Cauda broad at base, tapered to a blunt point, generally with 3 hairs on each side. Bases of femora lighter than rest of legs. Spinal hairs occur singly from prothorax to 8th abdominal tergite. Pleural hairs present on thorax, and sometimes on first abdominal segment, rarely on other segments. Generally 2 marginal hairs on abdominal segments 2, 3 and 4, and 1 on segments 1, 5, 6 and 7.

Measurements of a single specimen.—Body excluding cauda: 1·00 mm.; antenna: 0·73 mm.; proportion of antennal segments: $\frac{14}{III}, \frac{5}{IV}, \frac{6}{V}, \frac{6+8}{VI}$; secondary sensoria: $\frac{6\ \&\ 7}{III}$, $\frac{0\ \&\ 0}{IV}, \frac{2\ \&\ 3}{V}, \frac{0\ \&\ 0}{VI}$; siphunculi: 0·18 mm.; cauda: 0·1 mm.; longest hair on front of head: 0·028 mm.

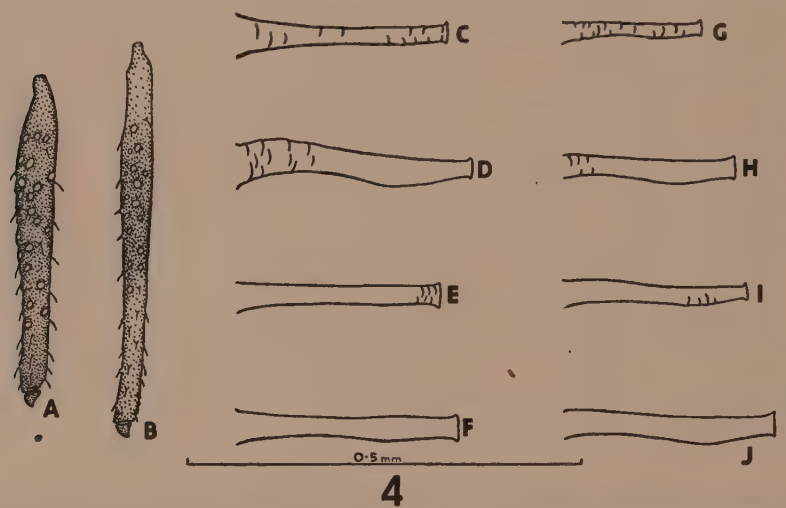

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FIG. 4.—A, C, E, G, I: *M. bucktoni*, hind tibia of ovip. female, siphunculi of apt. vivip. female, alate vivip. female, apt. male and ovip. female respectively. B, D, F, H, J: corresponding features of *M. rosarum*.

Oviparous female (figs. 3, 4).

Living specimen.—Pale olive green, dusky. Head brownish. 2 brownish patches on pronotum. Antennae, legs, siphunculi and cauda dusky translucent. Hind tibiae brown and conspicuously swollen. Subgenital plate light brown.

Macerated specimen.—Head and pronotum dark and sclerotic, otherwise, dorsum membranous: pronotum with two large dark sclerotic patches. Head very strongly convex, with slight antennal processes: on the frontal process there are 2 pairs of long blunt to spathulate hairs, one on each antennal process, and about 8 or 9 on the vertex: longest hairs about equal in length to the basal diameter of 2nd antennal joint. Antennae generally 5 jointed, sometimes 6 jointed: I is rounded on its inner side; III slightly shorter than V; processus terminalis slightly longer than base of V; IV about equal to base of V. Basal part of III lightly, remainder of antenna fairly strongly pigmented. Antenna has several pointed hairs which are about as long as the basal diameter of V. Legs lightly pigmented, with tips of fore and mid tibiae, hind tibiae and tarsi more strongly so; hind tibiae swollen and with about 25 sensoria on the middle part, much darker than the other

tibiae. Siphunculi long, slender, cylindrical, slightly imbricated, with only a slight tendency to swelling on the distal half. Cauda broad at base, tapering to a blunt point, fairly heavily pigmented, generally 3 hairs on each side. Subgenital plate sclerotic and pigmented, 2 hairs on anterior part, about 8–10 along the posterior margin. There are 4 rather long spathulate hairs on the 8th abdominal tergite and 4 on the 7th. On the rest of the body there is a full complement of single very short spinal hairs. Pleural hairs present on thorax, but irregular and sparse on abdomen; marginal hairs occur singly from the prothorax to the 7th abdominal segment.

Measurements of a single specimen.—Body excluding cauda: 1·38 mm.; antenna: 0·56 mm.; proportion of antennal segments: $\frac{10}{III}, \frac{4{\cdot}5}{IV}, \frac{4+6}{V}$; $\left(\frac{8}{III}, \frac{3}{IV}, \frac{4{\cdot}5}{V}, \frac{4{\cdot}5+6}{VI}\right.$, in a specimen with six joints); siphunculi: 0·25 mm.; cauda: 0·13 mm.; longest hair on front of head: 0·032 mm.; pseudo-sensoria on hind tibiae: 27 and 25.

Eggs are yellow when laid and turn to black in a few days.

Biology.

Apterous viviparous females generally found on the upper side of the leaflets feeding on the midrib. Larvae appear to wander away from the parent, so that compact colonies have not been found. Newly hatched larvae were found on 18.iv.1944, at Bellingham, Northumberland. Colonies were formed on a potted plant of *R. canina* to which eggs collected at Wicken Fen (14.xi.1944) had been transferred. These eggs probably hatched during April. A pure line sub-culture derived from this stock produced alatae in June. The parent colony became very overcrowded, but no alatae were found in it: even under extremely unfavourable conditions no further alatae were produced. In Northumberland sexuales were found on 3.xi.1943, in Cambridgeshire on 14.xi.1944; in the cultures they were first noted on 28.ix.1945. The oviparous females live on the leaves until fertilised, and then look for suitable oviposition sites. The males move about rapidly and are difficult to find. This would appear to be a somewhat rare species.

Hosts.

Rosa villosa L., *R. tomentosa* Sm., *R. canina* L. Druce (1932) has been followed in naming these plants.

Distribution.

Northumberland, Westmorland, Cambridgeshire.

Types: Cotypes in the author's collection.

Acknowledgement.

The author is very much indebted to Dr. Hille Ris Lambers for the interest which he has taken in this work, and for the loan of specimens. The author also wishes to thank Dr. Hille Ris Lambers and Dr. I. Thomas for their helpful criticism of the typescript.

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MIDDLE EAST LEPIDOPTERA—V [1]

A NEW GENUS, A NEW SPECIES, AND TWO NEW RACES FROM IRAN, WITH TAXONOMIC NOTES ON OTHER PERSIAN HETEROCERA

By E. P. Wiltshire, F.R.E.S.

The following descriptions and notes are made from material taken by myself in 1939–42 in Iran (Persia). Earlier articles in the series have given some account of the geographical and floristic features of the interesting region inhabited by these Heterocera; fuller ecological details also appeared in "Studies in the Geography of Lepidoptera—III" (*Trans. R. ent. Soc. Lond.* **96** : 163–182), an article primarily concerned with common species of moths and butterflies already well known.

Acknowledgment made in the first paragraphs of the previous article in this series apply equally to the present. In addition, the friendly co-operation of Mr. J. McDunnough and Dr. K. Jordan must be gratefully acknowledged.

The assistance provided by Dr. W. T. M. Forbes was so detailed and extensive that his notes on the three Fars "winter-moth" Geometridae have been included verbatim in the concluding section of this article, together with his genitalia drawings. These were × 50, and appear reproduced × 25. My own drawings of the larger genitalia, made with a *camera lucida* at × 30, appear reproduced × 15.

Lemoniidae.

Lemonia peilei Rothschild subsp. **farsica** subsp. n. (Pl. 1, figs. E, F, G, H).

This subspecies is larger than *pia* Pungler and also differs therefrom on the underside, where the submarginal area is not paler. The male is deeper chocolate-brown and more variable in size and markings than are those I have taken at Kermanshah, W. Iran, and consider to be *L. p. peilei* Rothschild. The white band of *farsica* is usually more emphatic, but can be dentate or smooth, fine or thick; the discal spot is also more variable, but is usually larger and clearer than in the Kermanshah form; in this respect therefore there is an approach to *balcanica* Herrich-Schaeffer. The female is paler brown than the male, sometimes approaching the yellow-brown hue of the Kermanshah males; its antennae are less deeply bipectinated and paler than the male's. Span: 36–42 mm.

Holotype. ♂, 20.x.1940, Pireh-Zan, c. 7000 ft. (oak woods), Fars, S.W. Iran.

Allotype. ♀, 27.x.1940, Sineh Sefid, c. 6500 ft. (scrubby hills), ditto.

Paratypes. 10 ♂, 10 ♀, 20.x.40, Pireh-Zan; 27.x.40, Sineh Sefid; 29.x.1940, Shiraz, 5000 ft. (hilly steppe near Salt Lake); 8.xi.1940, Khan-i-Zinian, c. 6500 ft. (scrubby hills); 8.xi.1941, Isfahan, 6000 ft. (1 ♂), steppe, Central Iran. Other material was sent to the British Museum in 1941. The above types are in my own collection.

The eggs of *farsica* are hemispherical, glossy white like porcelain, with a

[1] The previous article in this series appeared in *Ent. Rec.* **58** (March 1946).

blackish apical dot and two brownish rings, the upper being broad and freckled, the lower finer. They do not agree with the description of *balcanica* ova in Seitz II. My *farsica* larvae unfortunately all died young. I give, however (Pl. 1, fig. C), the photo of a *Lemonia* larva from Qizil Robat (near Mirjana), the type-locality of *peilei*. This larva died as a pupa, so its identity as *peilei* is presumptive only. The descriptions of *balcanica* larva (Spuler & Seitz II) do not fit this larva.

My series of Persian *Lemonia peilei*, six males from Kermanshah and the above types of *farsica*, seem to be the first of this group from the Near or Middle East to include females of which there is a record; I have a longer series of each of these two Persian races than either Pungler or Rothschild had when describing *pia* or *peilei*.

Rothschild (1921) reported two species of *Lemonia* from Iraq and Iran: *pia* Pungler (1 ♂ from Qazvin, N. Iran) and *peilei* Rothschild (3 ♂ from Mirjana, near the Persian frontier of Central Iraq). Pungler's *pia* was described from only 2 ♂ from Palestine; its author thought it might only be a race of *balcanica*.

The type of *peilei* is not in good condition, according to Dr. Jordan, nor is the single male from Qazvin which Rothschild identified as *pia*. The wing-shape of this *peilei* type appears narrower than that of the Kermanshah male shown on my plate only because its fringes are missing. Furthermore, in this group the costa may be straight or concave, the cross-line curving or straighter, varying individually. It is therefore very doubtful whether the characters given by Rothschild as separating *peilei* from *pia* ("wings longer and narrower") are a real criterion; *peilei* seems to be larger, admittedly; but even this difference may have to be dropped when a longer series from Palestine is available. The chief difference, indeed, and one not particularly stressed by Rothschild, is the paler marginal field in *pia*.

The British Museum (N.H.) also has at Tring some *Lemonia* specimens from Demavend (N. Iran). In these the discal spot is larger, i.e. as in *balcanica* or *farsica*. The Qazvin specimen is intermediate between them and *peilei*. Brandt, *in litt.*, informs me that he has a series like *farsica*, from Sultanabad. This form therefore seems to be widespread on the Iranian plateau. Nowhere in Iran, however, is there anything quite approaching subsp. *anatolica* Wagner, described as a race of *balcanica* from Turkey; it is a very pale, almost unmarked form, with a vague but triangular or trapezoidal discal spot; from among his material Wagner described two as ab. *brunneomarginata*, with a chestnut-brown marginal field. This aberration suggests an approach to the Kermanshah *peilei*, some of which have a slightly darker marginal field.

The male genitalia of *Lemonia* unfortunately do not afford marked specific differences. According to Dr. Jordan, some obviously distinct species have identical genitalia. These parts are, in the male, of a primitive type. In the specimens of the *balcanica* group at Tring which he examined (including the Persian "*pia*" and *peilei*), Dr. Jordan noticed that some had a tooth on the uncus-tip (or tip of the 10th tergite, for there is no true uncus), but he suspected this was an individual variation. My own investigations of the Pireh-Zan series fully confirm that this tooth may be present or absent in different individuals of the same race, the tergite-end being toothed or obtuse. According to Dr. Jordan, the male genitalia of the Tring Persian and Iraqian *Lemonia* specimens mentioned above cannot be distinguished from those of *balcanica*. The *pia* types have not been accessible for microscopic investigation.

Owing to the above differences in ova and larvae, I think it probable that *peilei* is a specific unit distinct from *balcanica*. I doubt whether further morphological or pattern-studies will clear up this question. More

probably the comparison of the early stages, when known, will decide. Perhaps, on the other hand, the female genitalia provide better distinctions than the male, but the females of *pia* and *peilei* do not seem to have been taken yet. Possibly *pia* is also a separate species, but if conspecific with the Persian *Lemonia* its name has the priority. A final revision will have to consider too the name *bremeri* Kollar (placed as a synonym of *balcanica* by Seitz) and the status of the race *anatolica* Wagner.

Cossidae.

Blalia vittata Rungs subsp. **persica** subsp. n. (Pl. 1, figs. J, K).

This species and genus were described in 1942 by Charles Rungs (Notes de Lepidopterologie Maroccaine (XI), *Bull. Soc. Sci. nat. Maroc.* **22** : 174, Plate 1, figs. 17–18), the types having been taken by Rungs in Morocco in 1941. On examining my 1939–42 Persian material I find that I have a series of seven specimens taken in 1940–41 in Fars. The Persian race differs less from the Moroccan than the vast intervening distance would lead one to expect; the chief difference is that the fore-wing upperside has no black scales, whereas in the Moroccan race there is a sprinkling of them, and a black edging to the median white line. Whether there is also a difference in ground colour cannot be ascertained without seeing Rungs' types, but to judge from his description there is none. It appears, however, from my longer series, that the species is rather variable, and I have selected, for the plate, two extremes of variation to represent the two sexes. The terminal white cloud on the fore-wing can, as in the *vittata* types, be confined to the space between nervures 4 and 7, but it can also extend as a marginal band along the whole termen or can be quite absent. The costal white triangle can also be pure white or can contain brown spots as described by Rungs. Span :—19 mm. (smallest ♂) to 30 mm. (largest ♀).

Holotype. ♂, 15.vi.1941, Shiraz, to light, in a town garden, 5000 ft.

Allotype. ♀, 28.v.1940, to light, n.w. shores of Salt Lake, near Shiraz, 5000 ft.

Paratypes. 2 ♂, 3 ♀, 28.v.1940 (with allotype), or 14.vi.1940 and 4.viii.1941 (same situation as holotype).

All types in my own collection.

Agrotidae, Cuculliinae.

Antitype crinomima sp. n. (Pl. 1, figs. A, B).

♂♀ Palp, all three parts with pale rosy brown and a few black scales and hairs, those on the third being much shorter. Antenna, scaled near base; ♂, with long cilia, not serrate; ♀, with shorter cilia, setoseciliate. Frons and thorax covered with rosy-brown, grey and a few black long hair-like scales. Abdomen grey with rosy-brown tufts on first two tergites.

Fore-wing, pale biscuit-coloured, thickly sprinkled with grey and rosy-brown scales. Basal-streak, fine, black, conspicuous, not reaching the claviform stigma. A second streak runs parallel to it close to the inner margin, beginning further terminad, and sometimes connected, by a black edging of the antemedian line, to the central streak. The black central streak joining the ante- and post-median lines starts along the lower edge of the claviform stigma. The stigmata and cross-lines are outlined in blackish, but not so conspicuously as the streaks. The angular antemedian line is weakest; the whitish post-median line has the inner edge (a series of blackish lunules) more conspicuous than the outer; in the ♀ however this too is weakly defined. The position of these lines and the two discal stigmata is as in other *Antitype* species. The orbicular is oval, black-outlined;

reniform, with a whitish black-rimmed outline and a grey-infused interior. Median field with grey scales prevailing; on it the nervures appear fine and black, with pale edging. Submarginal line, zigzag, yellowish-white, running as in other *Antitype* species, the pale points being accompanied by strong rosy basad wedges. Terminal field sometimes clouded with blue-grey. Termen crenulated, marked with black between the nervures. Fringes chequered rosy and greyish-brown.

Hind-wing, ♂, dirty white, with vaguely brown discal spot and nervures, and a tendency to a submarginal shade on the "trifid" nervures. Termen wavy, brown. Fringes whitish or pink. ♀, brown-suffused, otherwise similar.

Underside, whitish, speckled with grey; discal spot and termen marked on both wings; other markings obsolete.

Span: 44–50 mm.

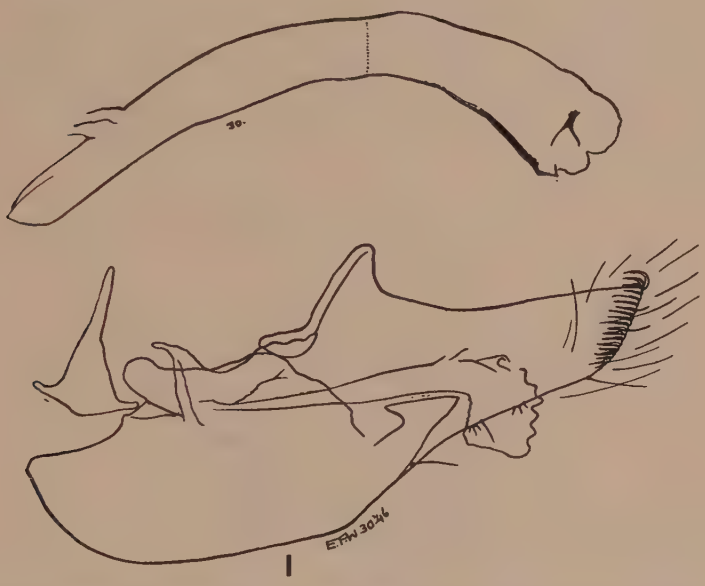

FIG. 1.—*Antitype crinomima* sp. n. ♂ genitalia: aedeagus, juxta, and right valva.

Holotype. ♂, 22.x.1940, 5000 ft., at honey-dew on fig-leaves, Kermanshah, W. Iran. In my collection.

Allotype. ♀, 20.x.1940, 7000 ft., Pireh-Zan, at light in oak-woods, Fars, S.W. Iran. In my collection.

Paratype. ♂, same data as holotype.

The male genitalia have the strongly chitinous, conical valva base and weakly-chitinous 10th tergite and uncus typical of the genus. Peculiar are the saddle-ridged costa, and the skin-like flap projecting over the lower margin between the sacculus and the corona. The corona and costa (upper margin) come to a simple apical point. The aedeagus is long and slender; its vesica has a 4-spined barb (see fig. 1).

This large and handsome new species almost deserves a new genus, but can be placed at the beginning of *Antitype* in a new section of its own, since this genus is already fairly heterogeneous in antenna-structure and facies. It agrees with other *Antitype* in palp, eye, frons, thoracic and abdominal tufts, legs and male genitalia, but differs in antenna and facies. It represents, in a

way, a link between *Antitype* and the genera *Dryobotodes* and *Crino*, whose streak-markings it shares. In facies it recalls *Crino solieri* Boisduval or *Anytus trisignata* Ménétriés. It flies in the same month as the latter and in some of the same localities, but can be distinguished from it, of course, not only by antennal structure and unspined tibiae, but also by its larger size and grey reniform spot. The phenology of all the species and genera just mentioned is similar: univoltine autumnal.

Fig. 2.—*Persidia achaemenica* Wiltshire. (a) palp. (b) ♂ genitalia, ventral view, without aedeagus. (c) aedeagus. (d) frons. (e) ♀ genitalia, excluding bursa.

Zenobiinae (Caradrininae).

Persidia gen. n.

Intermediate between *Metopoplus* and *Mycteroplus*.

Palp, hairy, hardly upcurved at first joint; last part, very short. Proboscis, lacking.

Frons, with shield-shaped or oval crater-like prominence, with raised edge enclosing a ridge which may take various forms, *e.g.* a 3-ridged low pyramidal point (fig. 2, d) or the letter C, the whole covered with long hairs.

Antenna, ♂, doubly bi-pectinate (" plumose "); ♀, simple.

Eye, large, smooth, without lashes.

Thorax with long hairs. Abdomen without tufts.

Fore-leg : tibia, hairy, spineless, with one large posterior claw (epiphysis); tarsus, all joints with short spines.

Mid-leg : tibia, hairy, spineless, with terminal spur; tarsus, spined.

Male genitalia, as illustrated (fig. 2, b, c).

Female genitalia, weakly chitined and not distinctive. In the figure (2, e) the bursa has been left out, being without signum.

Genotype. *Margelana achaemenica* Wiltshire 1941, *J. Bombay nat. Hist. Soc.* **42** : 472–477, fig. 5.

Atethmia xerampelina Esper and *A. pallida* Staudinger.

After examining the genitalia of several examples of each sex of both of these forms, I can detect no significant difference, and conclude that *pallida* is no

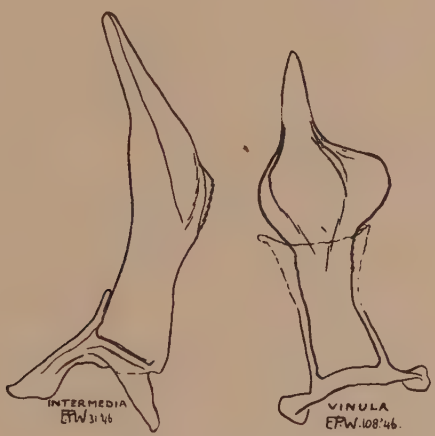

Fig. 3.—*Dicranura intermedia* Teich. ♂ aedeagus (Iran).
Fig. 4.—*Dicranura vinula* L. ♂ aedeagus (Britain).

more than a subspecies or race of *xerampelina* distinguished by the paler coloration of the adult and also the reduced pigmentation of the larva (see Wiltshire 1943 for fuller details of the biology of *pallida*).

Notodontidae.

Dicranura intermedia Teich. and *D. vinula* L.

Until I recently compared the male genitalia of these two moths, my reasons for regarding them as specifically distinct were simply :—

(1) *intermedia's* fore-wing has the two parallel submarginal zigzag dark lines much closer together, the outer one forming sharper inward points between the nervures.

(2) *intermedia's* larva is always green dorsally in its last instar and the subdorsal line never approaches nearer the spiracles than 3 mm. when mature (see Wiltshire 1939 for fuller details and photos).

(3) *intermedia* has two broods in quick succession; the gen. ii pupae undergo a long aestivation and this diapause continues as a hibernation. Typical *vinula*, however, is single-brooded; the gen. i pupae hibernate.

(4) Some authors regarded *intermedia* as distinct.

The male genitalia of *intermedia*, I now find, differ from those of *vinula* in having rounder, more chitinous valvae and a less bulbous penis, with a more arched "instep" (cf. figs. 3 and 4). This strengthens my opinion that *intermedia* is specifically separate, but I still think this idea might have to be revised if it should be found that the two forms intergrade; however, it remains to be seen whether their ranges overlap, or even approach each other closely. Both are recorded from Turkey, and that country therefore will probably provide the last word on the problem. *D. intermedia* ranges from E. Turkey to N.W. India.

Geometridae.

Erannis bahmana Wiltshire (1943, *J. Bombay nat. Hist. Soc.* **44** : 247–251) and *Boarmia ghirshmani* Wiltshire (1944, *Ent. Rec.* **56** : 97) transferred to *Epitherina*.

Thanks to Dr. W. T. M. Forbes, I am able to amplify the original descriptions of the above species and of *Epitherina pistaciae* Wiltshire (1943) and *Heterobapta plumellata* Wiltshire (1943) and to clarify, as far as the available material permits, their generic position. Dr. Forbes' notes below also give interesting structural details about *Epitherina rhodopoleos* Wehrli.

Dr. Forbes' researches confirm my placing *plumellata* in a new genus, and give further structural details for this genus (*Heterobapta*). My original attribution of *E. bahmana* and *E. pistaciae* was provisional; Dr. Forbes shows that both of these may be attributed to *Epitherina* for the present and that *ghirshmani*, pending an examination of a male *rhodopoleos* Wehrli, is best put in that genus too.

Neither in my own nor the Brandt collection (Herrala, Finland) does a male *E. rhodopoleos* exist, and probably none has been taken yet. This is rather strange. Dr. Forbes has been able to examine my entire material of this group from S.W. Iran.

The so-called paratype of *ghirshmani* proved to be a ♂ and becomes the allotype.

One other point also calls for comment, viz., Dr. Forbes' remarks on both sexes of *E. bahmana*, which I described on the basis of a single (bred) ♂. Dr. Forbes has detected two species in my series of six females labelled *E. rhodopoleos*, and has regarded the species that is not *rhodopoleos* as the ne-allo-type of *bahmana*. There were four specimens of this form. Since the original figure of *bahmana* was not very recognisable I now give a better picture of the holo- and ne-allo-type and also of another female. (Figs. L, M, N.)

Notes by Dr. W. T. M. Forbes.

I am indebted to Mr. E. P. Wiltshire for the opportunity to examine this little group of Ennomine Geometridae from S.W. Persia. Although now standing in several genera they appear closely related in fact, and to have some connection with the well-known and world-wide genus *Bapta*, as shown by the simple, somewhat fasciculate male antenna (*Epitherina* unknown), close-scaled and bulging front; absence of gnathos as a specialised organ; small socii, at least represented by a bulge and tuft of bristles; somewhat lobed sacculus, in the best preserved specimens at least bearing a spreading hair-pencil on outer

side of valve; unmodified costa; and large juxta, sometimes bearing processes or paired bristle-tufts, but without a true furca. The larvae are also smooth, but as figured by Wiltshire are stouter than in typical *Bapta*.

The well-known *Aleucis pictaria* Curtis probably has some connection with this group, having a larva stouter than normal *Bapta*, and with diagonal pattern, and a grey colouring approaching this type. *A. pictaria* also has a floricomus (anal tuft) in the female, like *E. rhodopoleos*, and unlike most *Bapta*.

All the species are quite distinct from *Bapta* in the straighter costa; marked and acute apex of fore-wing, and more modified front; but the genitalic characters are widely divergent, and in a more homogeneous group would probably be rated of generic value. As it is, it seems improper without further study to make so many genera, and they may be forced into *Epitherina* and *Heterobapta*. Unfortunately the male of *Epitherina* is wholly unknown, and the discovery of its characters may result in some changes.

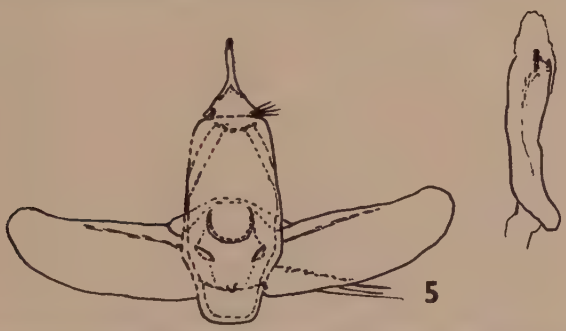

Fig. 5.—*Heterobapta plumellata* Wiltshire ♂ genitalia, ventral view with aedeagus separated.

Heterobapta plumellata Wiltshire.

Male antennae serrate and heavily fasciculate with only two tufts to a segment; front conical, the apex of the cone above middle of front, and much higher than in *E. rhodopoleos*; the mouth not extended forward. Some coarser and looser scales about base of cone, but no definite tuft above mouth. Gena broad, naked, sharply angled behind but not in front, not scaled in the specimen at hand. Eyes wider than front. Fore-wing without fovea, shaped like the preceding; R_{1+2} arising from cell far before R_{3-5}, but so oblique in course that they run closely parallel; anastomosing at a point or not with Sc, then more closely parallel to R_{3+4} for a considerable distance, at the middle of which R_1 separates off and runs to costa. R_{3-5} arising from cell nearer end than in *E. rhodopoleos*. Hind tibia slender.

Male genitalia of *Bapta* type; uncus slender, normal; socii represented by a pair of low hairy pads, as often in *Bapta*; gnathos broad but lightly chitinized and without any special pointed apex or armature; valve simple, the costa narrow, fading out to apex, not lobed; sacculus a small short lobe, not well set off, with some long hair. Juxta lightly chitinized, the distal part modified into a cylindrical sheath for the aedeagus; truncate at end, the flat base with two oblique sharp-edged lateral flanges at bases of valves. Aedeagus without cornuti, the outer chitinized sheath lengthened into a couple of short terminal processes.

This is definitely a derivative of *Bapta*, but distinct enough in the wing-form, appearance, much larger (though lightly chitinized) gnathos, and enclosure of the aedeagus by the juxta. The venation is a common type, occurring in several groups, and the modified head, while a good diagnostic character, may be merely an adaptation to eremic conditions.

Epitherina rhodopoleos Wehrli.

Female: Head with front as wide as eyes; with a long truncate conical tuft, rather coarsely but smoothly scaled; the chaetosema small but normal; gena wide, much wider at ends than middle, with straight lower edge, ending in front in a conspicuous blunt point, and scaled on anterior portion. Tongue carried forward on lower side of the truncate cone almost to its apex, lying beyond the tip of the short broadly scaled palpi, which have a moderately long but inconspicuous porrect third segment. Anal tufting composed of a circle of blackish scales surrounding the anal structures proper, which end in a double pencil of curled yellowish hairs. Fore-wing with costa nearly straight, apex marked and outer margin oblique. Fore-wing with all veins; R_1 arising well before R_{2-5}, which arise well before the end of cell; sinuous, approaching Sc and then R_2, without anastomosing; R_2 arising out of stem of R_{3-5}, then closely approaching the stem of R_{3+4} beyond the point of origin of R_5, apparently connected or anastomosing with it, and then running free to margin. Venation otherwise normal Ennomine.

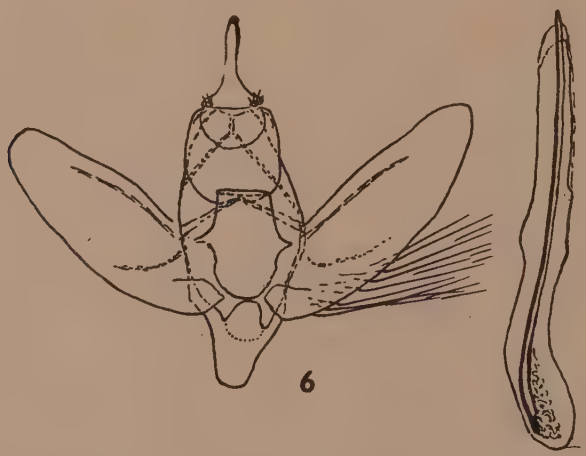

Fig. 6.—*Epitherina ghirshmani* Wiltshire ♂ genitalia, ventral view, with aedeagus separated.

Our present classification of the Ennomine (Selidosemid) geometers is so wholly based on male characters that it is impossible to place this in any system or any published key; the general appearance suggests relation to the following, and the floricomus, perhaps, a special connection with *Bapta* (*Aleucis*) *pictaria*.

Epitherina ghirshmani (Wiltshire).

Front nearly normal for *Bapta*, strongly bulging, close-scaled, but without any specialised prominence; the mouth a little set forward on its lower side, but at least in the male exceeded by the rather long palpi. Eyes much wider than front; gena linear, obscure; male antenna prismatic, very smooth, without enlarged setae. Tongue strong and hind tibia unmodified, as usual in this group. Fore-wing of the usual triangular shape, unlike *Bapta*, but rather like some *Boarmia*, without fovea; R_1 and Rs arising rather close together well back from end of cell; R_1 anastomosing definitely with Sc and then with R_2, which arises out of the stem of R_{3-5} just before R_5 leaves it; and does not rejoin R_{3+4}.

Male genitalia of *Bapta* type: uncus rather slender, normal; socii represented by minute but definite bristly pads, only visible with high power; gnathos a thin almost

circular lightly chitinized disc, somewhat emarginate at ventral edge; valve simple, as in *Heterobapta*, but the sacculus lobe less obvious, though with a more obvious hair-tuft (corema). Juxta with main part lightly chitinized and simple, the part surrounding the aedeagus a conspicuous complete cylinder, abruptly cut off, and longer than in the other species. Aedeagus slender, with a single extremely long spine, attached at near its base but so long as to project shortly from its apex.

This species is definitely related to *Heterobapta plumellata*, but more primitive in the nearly normal *Bapta*-like head. The venation is a slight further development of *Epitherina*, and until the male of the latter is known may find a place in that genus, in spite of the frontal structure.

Epitherina bahmana (Wiltshire).

Head as in the preceding, the gena perhaps even narrower, but similar; male antenna moderately serrate and fasciculate, the bristles more even in length than in *H. plumellata*. Fore-wing as in *Epitherina*, but with no fusions, R_1 closely approaching Sc and R_2, and R_2 closely approaching R_1 and the stem of R_{3+4} without fusing.

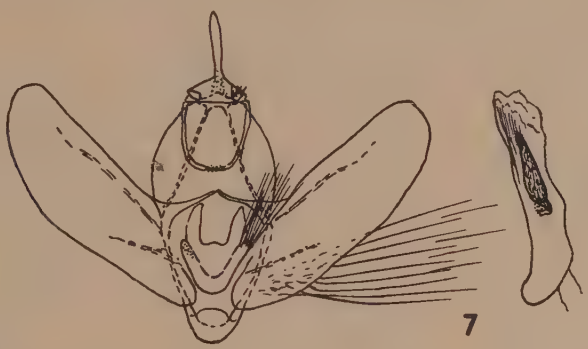

Fig. 7.—*Epitherina bahmana* Wiltshire ♂ genitalia, ventral view, with aedeagus separated.

Male genitalia with uncus and valve as in the preceding, the socii a little more obvious but of the same type; juxta distinctive, deeply cleft and bracketing the aedeagus on both sides, but not surrounding it; with a V-shaped ridge bordering its ventral half, each apex of which ends in a tuft of bristles. Aedeagus with a single massive cornutus, half as long and nearly half as thick as the shaft; terminal portion of shaft striate externally. Female similar to *E. rhodopoleos*, but darker, and easily distinguished by the different front (though it has been confused); no visible floricomus.

This structurally conspicuous but superficially obscure species has nothing to do with *Erannis*, or the Bistonini at all. While more primitive in head-structure it is the nearest to *rhodopoleos* of the forms studied, and can stand in *Epitherina* at least till the male of the latter is discovered. The curious juxta, with cleft and lateral bristle-tufts, occurs in an exaggerated form in an undetermined species which I have received wrongly labelled *Aleucis pictaria*.

Epitherina (?) *pistaciae* Wiltshire.

Front flat; gena linear (♂ not examined). Fore-wing with R_1 arising out of R_2 near origin and running directly across to Sc, not again separating; wing form as in the preceding species; pattern more complex, more *Boarmia*-like; larva stout and smooth,

not *Boarmia*-like. Female with some indication of a floricomus, but not forming a ring about the end of the abdomen.

Without the male this species cannot be safely placed. It has no distinctive feature of the *Bapta* group (unless the smooth larva, which also occurs in various other groups), and the venation is as in some American members of the *Boarmia* group; in Europe it is less common, but occurs e.g. in *Isturgia*. One may venture the prophecy that the male antennae will be pectinate.

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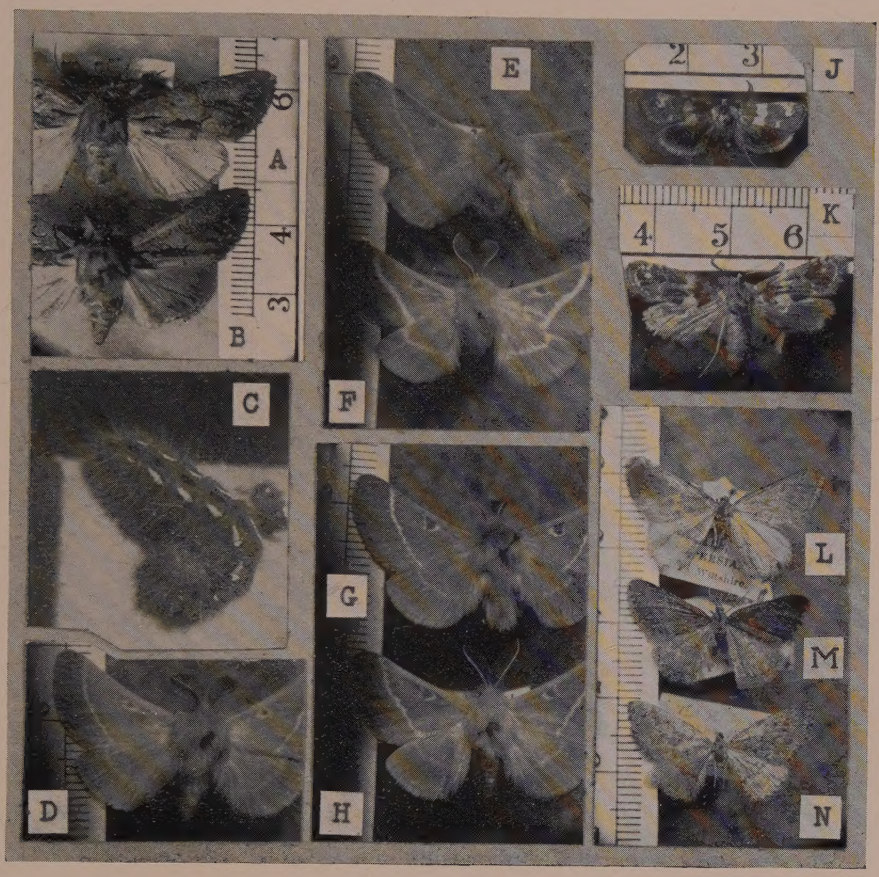

E. P. Wiltshire. Explanation of Plate 1.

Figs. A (♂), B (♀). *Antitype crinomima* sp. n., types.
Fig. C. *Lemonia peilei* Rothschild (Qizil Robat), larva.
Fig. D (♂). *Lemonia peilei* Rothschild (Kermanshah).
Figs. E (♀), F (♂), G (♂), H (♂). *Lemonia peilei* Rothschild subsp. *farsica* subsp. n., types.
Figs. J (♂), K (♀). *Blalia vittata* Rungs subsp. *persica* subsp. n., types.
Figs. L (♂), M (♀), N (♀). *Epitherina bahmana* Wiltshire, types.

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1946.

WEDNESDAY, October 16
„ November 6, 20
„ December 4

1947.

WEDNESDAY, January 15 (ANNUAL MEETING)
„ February 5

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